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United States Patent [19]

Kreuter et al.

[11] **Patent Number:** **6,117,454**[45] **Date of Patent:** ***Sep. 12, 2000****[54] DRUG TARGETING TO THE NERVOUS SYSTEM BY NANOPARTICLES**

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[*] Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

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Related U.S. Application Data

[63] Continuation of application No. 08/556,125, Nov. 9, 1995, abandoned, which is a continuation of application No. 08/203,326, Feb. 28, 1994, abandoned.

[51] **Int. Cl.⁷** **A61K 9/52**; A61K 9/51

[52] **U.S. Cl.** **424/490**; 424/489; 424/491; 424/492; 424/493; 424/496; 424/497; 424/498

[58] **Field of Search** 424/489-498

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[57] ABSTRACT

A novel method of delivering drugs and diagnostics across the blood-brain barrier or blood-nerve barrier is disclosed. Drugs or diagnostic agents are incorporated into nanoparticles which have been fabricated in conventional ways. These nanoparticles are then coated with additional surfactant and given to the body of animals or humans. This allows drugs or diagnostic agents to cross the blood-brain barrier (bbb) to achieve one or more of the following benefits: (1) reducing the dose of a therapeutic drug or diagnostic agent which, when given peripherally, maintains the biological or diagnostic potency in the nervous system, (2) allowing drugs that normally do not cross the bbb to penetrate into the nervous system, and (3) reducing the peripheral side effects by increasing the relative amount of the drug reaching the brain.

13 Claims, 3 Drawing Sheets